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STYLES OF CATEGORIZATION AMONG LOWER-CLASS KINDERGARTEN CHILDREN.

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BASED UPON WORK WITH MIDDLE-CLASS ADULTS AND CHILDREN, THREE APPROACHES TO GROUPING HAVE BEEN IDENTIFIED--(1) DESCRIPTIVE PART-WHOLE, (2) RELATIONAL-CONTEXTUAL, AND (3) CATEGORICAL-INFERENTIAL. A COMPARISON WAS MADE OF THE FREQUENCY OF THE USE OF THESE APPROACHES AMONG MIDDLE- AND LOWER-CLASS, NEGRO PRESCHOOL AND KINDERGARTEN CHILDREN. INITIALLY, SIMILAR TESTING PROCEDURES WERE USED, BUT THE DIFFICULTY OF LOWER-CLASS CHILDREN IN GROUPING LIFE-SIZED PICTURES OF OBJECTS REQUIRED THE ADDITIONAL USE OF ACTUAL OBJECTS. IN THE DESCRIPTIVE PART-WHOLE CATEGORY, THE LOWER-CLASS CHILDREN TENDED TO GIVE MORE COLOR RESPONSES THAN MIDDLE-CLASS CHILDREN. COLOR WAS FOUND TO BE THE PREFERRED CRITERION OF CHILDREN ABLE TO VERBALIZE, A FACT THAT SEEMED TO INDICATE THAT FORM DOMINANCE IS MOST PRIMITIVE, LATER FOLLOWED BY COLOR, AND THEN BY THE REINTRODUCTION OF FORM WHEN CHILDREN LEARN TO USE FORM LABELS. THE USE OF THE RELATIONAL-CONTEXTUAL MODE (MORE FREQUENT AMONG MIDDLE-CLASS GIRLS AND NEGATIVELY RELATED TO ANALYTICAL THINKING) WAS FOUND TO INCREASE IN FREQUENCY IN KINDERGARTEN AMONG LOWER-CLASS CHILDREN WHO DID NOT HAVE HEADSTART EXPERIENCE. THESE CHILDREN INITIALLY GAVE FEW CLEARLY VERBALIZED RELATIONAL-CONTEXTUAL RESPONSES, BUT TENDED TO INCREASE THE NUMBER WHEN THEY WERE NOT REQUIRED TO HAVE A HIGH DEGREE OF ARTICULATION NOR USE TWO OR MORE OBJECTS. LOWER-CLASS CHILDREN GAVE FEW RESPONSES IN THE CATEGORICAL-INFERENTIAL CATEGORY. THIS PAPER WAS PRESENTED AT THE AMERICAN EDUCATIONAL RESEARCH ASSOCIATION ANNUAL MEETING (NEW YORK CITY, FEBRUARY 1967). (JL)

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Styles of Categorization among Lower-Class Kindergarten Children [1, 2]

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Human beings, faced with complex and diverse array of stimuli, can only adapt to this environmental diversity by organizing the stimuli into groups. Grouping of items requires identification of attributes by which to define group membership. Virtually every item can be defined as a member of a large number of groups, since all objects, personal or nonpersonal, are multidimensional. The simplest object, such as a ball, can be classified or grouped on the basis of its color, its shape, its function, its texture, its material, etc. Each of these attributes is legitimate for defining class membership and thereby relating this particular object to any other object or objects. These groups are in effect classes of items, defined by whatever criterion or criteria employed. The act of building classes is called classification behavior.

Classification behavior occurs in all human societies, but the criteria employed for building classes are a function of cultural conventions reflecting the culture's view of the world. Thus, in some societies, certain edible items may be placed in a class of the nonedible. Pork, for example, is a nonedible for Orthodox Jews and Moslems, but an edible for Christians. Classification behavior is evident in all

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cultures with the content of the class and the criteria for determining relationships between instances to form a class varying.

Categories or classes, however, can be built which are not consistent with cultural conventions or linguistic restrictions. No doubt the degree to which this can be done depends on whether the culture allows for nonconformity to taxonomic conventions. If criteria are viewed as unalterable and fixed, new categories can not be created. This is in contrast to a system in which alterability is not only acceptable but rewarded. Creativity and originality are manifestations of reordering items by use of criteria heretofore not considered relevant, appropriate or applicable. Guildford's "UsesTask" is an excellent illustration of a task in which subjects are rewarded for reordering criteria by which to identify and to classify an item. Conventional taxonomies are not necessarily pervasive, particularly in cultures which allow for deviance, i.e. using alternative criteria by which to define classes and their members.

Within our own society, objects, by virtue of the relative openness of taxonomic systems as well as the polydimensionality of objects, can be labeled or identified in many ways.

Items can be defined as a member of more than one class depending upon the attribute selected. If one were selecting color as a criterial attribute, the blue ball could be placed in the same class as the blue automobile. If the function of the object were selected, the ball and the automobile would be placed in different classes.

The individual chooses attributes, singly or in combination, by which to define the groupings. He may select attributes which are

observable and palpable, or he may infer attributes. Such behaviors are indicative of classification preferences. Style of categorization is the term employed to designate such grouping preference behavior. Styles are assumed to reflect consistent response tendencies by which arrays of objects are ordered.

Individual differences in criteria selection for grouping arrays of stimuli have been found (Kagan, Moss, Sigel, 1963). We have identified certain styles of grouping, which I shall describe. The relevance of the styles to psycho-social variables will be the focus of my discussion. Further discussion of these in particular context will be presented by Dr. Beller and Dr. Shipman.

It should be made very clear that when we speak of styles, we are speaking of preferences, wherein a preference reflects an individual's mode or habit rather than an ability. This distinction is crucial, since a preference is an indication of an individual's desired way of approaching materials and should not be construed as a sign that alternative approaches are not available to him. For example, some individuals prefer to organize objects on the basis of manifest or observable cues, e.g. form, color, texture, etc., while others prefer to make inferences. When faced with an array of people, such as in this room, they may group them on the basis of those who wear glasses or those who don't, men versus women, etc. These are manifest cues which are identifiable and wherein there is a high degree of potential common denotable traits. The same group could be classified as "professional persons," inferring status or function of the group. Either response is valid and is assumed to reflect a preferential mode of classifying which should not be construed as

indicative of an inability to employ other criteria by which to form a class.

A number of styles of categorization have been identified by various writers, such as Broverman (1960), Gardner (1959), Kagan, Moss and Sigel (1963), and Witkin (1962). Time does not permit going into the rationale as well as the definitions of the dimensions each of these writers has identified. Suffice it for us now to report on the categories we employ and and their psychological significance (Kagan, Moss, Sigel, 1963; Kagan, Rosman, Day, Albert, Phillips, 1964; Sigel, 1965; Sigel, Jarman, Hanesian, 1967).

Our interest is in identifying styles of categorization among various populations and determining antecedents and correlates of such behaviors, e.g. intellectual and personality characteristics. Based on work with middle-class adults and middle-class children, we were able to identify three types of approaches individuals employ when faced with the task of grouping. One is <u>decriptive</u> <u>part</u>-<u>whole</u>, which refers to grouping on the basis of an aspect of a set of stimuli, employing manifest cues. For example, given an array of pictures of people or objects, a respondent may say "these are alike because they have shoes," thereby offering a criterial attribute that is a common denominator on a manifest level. This type of grouping behavior has been found to relate for both boys and girls, as well as adults, to a number of personality and intellectual variables. Use of these categories relates differentially for boys and for girls. For young boys, the use of <u>descriptive</u> <u>part</u>-<u>whole</u> criteria relates positively to achievement striving, cautiousness and independence; where for girls, it relates negatively to cautiousness, but

positively toward achievement striving (Sigel et al, 1967). The fact that we could identify this category with middle-class children led us to apply it ot our work with lower-class children.

At first, similar testing procedures were used to insure comparable data between the two social class groups. Sorting tasks made up of pictures of animals, humans, and inanimate objects (vehicles, food, transportation) were employed. Lower-class preschool and kindergarten children had difficulty in grouping the pictures and even when they did create a group, had difficulty providing an explanation for it. These children found it easier to respond to life-sized objects. Could it be that pictures of objects are not in fact viewed as representative of their three-dimensional counterparts, and hence objects and pictures are not interchangeable? A study was done to test this idea. Using life-sized objects and photographs of them, it was found that the objects were easier for lower-class Negro preschool and kindergarten children to group than pictures (Sigel, Anderson, Shapiro, 1966). Pictures are apparently not of the same class as their three-dimensional counterparts. This is different from what was anticipated, since in previous work no such differences were found (Sigel, 1953, 1954). In our studies of cognitive styles, we continued to use two sets of materials, one made up of the life-sized colored objects and the other, life-sized photographs of these objects.

We discovered that lower-class children and middle-class children differed in the kinds of <u>descriptive</u> responses they would use. Lower-class Negro boys and girls tended to give more <u>color</u> responses compared to middle-class Negro children. It was only after exposure to Head Start

and subsequent kindergarten experience that the lower-class children began to use more form responses (Sigel and McBane, 1967). Form responses denote shape and contour; in contrast to isolating a structural part of the object, e.g. handles, wheels, legs, etc. The middle-class children use parts of the object as their basis of grouping much more frequently than the lower-class children. In fact, such part-whole responses were rarely found among the lower-class group. Use of similar or identical parts of items as bases of classification should be distinguished from emphasis on form quality, e.g. roundness, straight edge, etc. I shall return to more on this later.

Lest we think that color is the most primitive, I hasten to inform you that we discovered among the lower-class kindergarten children that those who did not verbalize rationales for any groupings of items tended to use form as the more frequent basis for grouping. In other words, for those children who were unable to verbalize, form was the more dominant mode, whereas for those children who could verbalize, color was more frequently the preferred criterion. Thus, we propose that form dominance may be in fact the most primitive, followed by color and the reintroduction of form as a criterion when children learn to utilize form labels. The significance of this finding rests on its theoretical contribution to understanding of saliency of particular cues basic to organization of the physical and social environment.

The fact that color among lower-class children is the most prevalent response may also indicate the emphasis on color responses in kindergarten. For some reason, it is very important to stress color labels and color identification, yet we must keep in mind that color

is not necessarily the most salient criterion by which to discriminate objects. It may well be that if in the kindergarten emphasis on form discrimination was equal to color discrimination this sequence might not be found. This might facilitate acquisition of reading skills in these lower-class children. In effect, we propose the question of whether the proposed developmental sequence might not be an artifact of educational experience.

A second mode of categorization is relational-contextual, which refers to groupings made on the basis of the interdependence of items in an array. Items are related by virtue of use, for example, "you use a match to light a cigarette," or "use a spoon to stir coffee." The relational-contextual orientation has been found among middle-class children to vary as a function of sex with the more frequent use among girls. Further, the psychological significance of this category is sharply distinctive for the sexes (Sigel et al, 1967, Sigel, 1966). For kindergarten boys, as well as older boys and adolescent males, utilization of such an orientation relates to passivity, to impulsivity, to dependence, and in some studies has been found to show strong trends of a relationship to femininity (Kagan et al, 1964; Sigel et al, 1967). For girls, however, these relationships do not obtain. Further, a most significant finding is that such an orientation has been consistently found to be negatively related to analytic thinking for children and adults. I must hasten to introduce here the fact that Wallach and Kogan (1965) utilized this category in their study on "Modes of Children's Thinking," and found this concept of relationality to be related to creativity. Whether this is a problem in conceptualization or methodology is still a moot question.

For our purposes, utilizing our own frame of reference, we find consistent results for males, where relational-contextual responses relate negatively to analytic thinking. For the lower-class children our results indicate that frequency of relational-contextual responses with increased exposure to kindergarten for children who did not have Head Start experience. We expect this to be a "primitive" orientation reflected in the child's application of his own experience to the context of the sorting task. After all, he does have direct experience with those objects in an action sense. For example, he uses such things as a pencil and a notebook, he writes with crayons on paper, he opens bottles with bottle openers, and the like. However, in our tasks, these do not receive the high frequency that we had expected, but are used less frequently than descriptive-color. Relational-contextual responses may be more indicative of a less sophisticated cognitive approach than the use of form. Extrapolating from other studies, relational-contextual responses are indicative of a non-reflective and non-conceptual orientation. It contra indicates analytic reasoning and thinking and would be expected to be a prevalent response pattern among lower-class children.

We used two criteria in scoring relational-contextual responses. The first criterion required clear articulation of relationality between two or more items and, under these conditions, lower-class children produced relatively few articulate relational statements. The second criterion was less rigid, not requiring a high degree of articulation nor even the use of two or more objects. One object could be used, e.g. a bottle opener is selected "because you open a bottle with this." Actually this is not a grouping response but we categorized such a response

since it does indicate the quality of relationships employed. Under the first criterion, a low frequency of relational-contextual responses was found, no doubt indicating relative inability to provide articulate verbal statements. Further, these children had difficulty in perceiving simple interrelationships. A much higher incidence of relational-contextual responses was found when the second criterion was employed.

Of particular interest is the finding reported by Kagan et al (1964) that relational-contextual responses related to impulsivity, i.e. non-reflective approach to categorizing. Sigel and McBane also found that lower-class Negro children, when given a test requiring control of motoric behavior, had more difficulty exercising such control than middle-class children (Sigel, McBane, 1967). This finding tends to suggest that the looser scoring of relational-contextual responses is a more accurate reflection of this type preference among lower-class Negro kindergarten children.

Relational-contextual responses increase concomitantly with color and form, indicating that awareness of functional relationships increases in saliency in sorting tasks with increasing experience. Much more needs to be done to understand the developmental significance as well as the relationship between relational-contextual responses to descriptive responses. To date, the former are more closely allied with affective expression while the latter are indicative of emotional control. Whether such consistent relationships are found among lower-class children is still open.

A third category is categorical-inferential, which is the application of a class label to an array of stimuli where every instance of the array

is a member of the class. It is the common definition of term concept. Placing a group of objects such as a saw, screwdriver, and axe together "because they are all tools," is an example of this type response. Objects can therefore be organized on the basis of use or just a class term. The utilization of the label and its appropriate application does not necessarily reflect the child's understanding of the concept. For example, in middle-class children, we fir that they would use the word animal appropriately, but only select animals which have four legs. In other studies we also discovered that the content of the category animal for young children contains only four-legged animals, and such instances as snakes, bees, are not usually included. The use of this category in its most extensive sense is infrequent among young middle-class children. Our lower-class children rarely gave responses of this type. Relationships between categorical-inferential responses and intellectual and personality characteristics have been found for middle-class children (Sigel et al, 1967). Since the frequency of this category is so low among our lower-class sample, we shall not dwell on this type of response here.

In the course of our studies with lower-class Negro children two significant findings occurred which have set the direction of our future research. (1) Styles of categorization employed by these children vary as a function of the representational nature of the stimuli involved, and (2) the styles vary as a function of the content of the material employed.

Previous research had led us to assume that categorization behavior did not vary with level of symbolic representation (Sigel, 1953). It

was argued that once the child acquired the meaning of an object, he would respond to it consistently whether it was presented as a three-dimensional item or a pictorial representation of it (Sigel, 1954). Such results did not occur with our lower-class sample. Three-dimensional items are not treated equivalently to their pictorial representation, suggesting that the definition of an object is contingent on its mode of presentation. Lower-class children of the age level studied here are not responding to the object in terms of its generic meaning but rather in relation to how it is represented. We discovered that these lower-class preschool children could create groupings when presented with three-dimensional life-sized objects, e.g. cup, spoon, pencil, notebook, etc,; but quantitative and qualitative differences are found when photographs of these objects, blown up in size equal to the original objects, were used. The fact that the lower-class children could group and could give some rationale for grouping objects rules out the issue of "ability to group" and places the problem clearly in the context of mode of representation (Sigel et al, 1966; Sigel, McBane, 1967).

Secondly, styles of categorization do vary as a function of the content of the material. Middle-class elementary school children use more descriptive and relational-contextual categories with stimuli depicting human figures than with objects and animals. With increase in age, however, use of descriptive part-whole responses increases for all types of materials, with a decrease in relational-contextual and an increase in inferential-categorical (Sigel, 1965).

The results with the lower-class children can be compared with those with the middle-class children. First there is a high degree of

descriptiveness already among the lower-class children. But, it should be kept in mind that this is where the similarity ends, since the lower-class children use color as their primary descriptive criterion. Form responses are less frequently used. Color should not be construed as reflecting a similar quality of descriptiveness as taking a structural aspect of a figure and seeking comparable parts on other figures. As mentioned before, to deal with parts of the whole requires the whole to be broken up into constituent parts. This is an analytic response. In the former case, identification of color does not seem to require such analysis. Form responses are more like the descriptive part-whole and may be prototypic of subsequent orientation toward structural analysis of objects. The fact that this orientation toward objects is not accentuated or reinforced may account for its relative low frequency in the response hierarchy. Is it not conceivable that continued emphasis on form quality, particularly in increasingly complex stimuli and emphasis on constituent parts might enhance the analytic ability of these children? Analytic ability in the form of discrimination and differentiation of structural units has implications for a host of intellectual performances (Sigel, 1963).

In summary, then, we can conclude the following:

(1) Sufficient evidence is available to support our contention that individuals from all social class groups have preferred modes of categorization, and the frequency of styles of categorization vary with social class, sex, and age.

(2) These modes of categorization are evident with various classes of materials, but vary in frequency. The creation of instruments to sample a larger array of classes is necessary.

(3) Personality characteristics appear to be closely associated with particular style preferences, interacting more clearly with sex and social class of the respondents.

(4) Measurement of "style" among lower-class children is feasible, and there is striking evidence that these styles vary as a function of representational level of the stimuli.

(5) Patterns of modes of categorization are found to vary among the various groups sampled, with pronounced differences appearing between lower-class and middle-class Negro populations.

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